

AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Page 1, between lines 1 and 2, please insert the section header:

Field of the Invention

Page 1, between lines 4 and 5, please insert the section header:

Background Information

Page 3, between lines 23 and 24, please insert the section header:

Summary of the Invention

Page 4, before line 1, please insert the following paragraphs:

The present invention provides modified perfluoroplastic, comprising a perfluoropolymer including a surface modified under influence of oxygen radiation-chemically or plasma-chemically, the surface simultaneously having –COOH and/or–COF groups and reactive perfluoroalkyl-(peroxy-) radical centers, and additional low-molecular and/or oligomeric and/or polymeric substances and/or olefinically unsaturated monomers and/or olefinically unsaturated oligomers and/or olefinically unsaturated polymers or mixtures thereof are coupled via some or all of the groups and/or to some or all of the centers.

The present invention also provides a method for producing a modified perfluoroplastic comprising a perfluoropolymer including a surface modified under influence of oxygen radiation-chemically or plasma-chemically, the surface simultaneously having –COOH and/or–COF groups and reactive perfluoroalkyl-(peroxy-) radical centers, and additional low-molecular and/or oligomeric and/or polymeric substances and/or olefinically unsaturated monomers and/or olefinically unsaturated oligomers and/or olefinically unsaturated polymers or mixtures thereof are coupled via some or all of the groups and/or to some or all of the centers, comprising reacting

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a perfluoropolymer that is radiation-chemically or plasma-chemically modified under influence of oxygen, which perfluoropolymers simultaneously exhibit –COOH and/or –COF groups and reactive perfluoroalkyl-(peroxy-) radical centers, with low-molecular and/or oligomeric and/or polymeric substances and/or olefinically unsaturated monomers and/or olefinically unsaturated oligomers and/or olefinically unsaturated polymers by substitution reactions and/or by addition reactions and/or by radical reactions.

The perfluoropolymer can be radiation-chemically modified under influence of oxygen.

The perfluoropolymer can be radiation-chemically modified with a radiation dose of more than 50 kGy.

The perfluoropolymer can be radiation-chemically modified with a radiation dose greater than 100 kGy.

The perfluoropolymer can be polytetrafluoroethylene.

The coupling reactions can be radical reactions and/or substitution reactions and/or addition reactions.

Olefinically unsaturated monomers and/or olefinically unsaturated oligomers or olefinically unsaturated polymers can be coupled to the reactive perfluoroalkyl-(peroxy-) radical centers through (co-) polymerization and/or through grafting.

The at least one substance can be coupled to the ester and/or amide bonds formed via reactions with the –COOH and/or –COF groups.

At least one additional functional group can be bonded to the at least one substance coupled via ester and/or amide bonds.

Via reactions with the –COOH- and/or –COF groups, aliphatic amino compounds and/or aromatic amino compounds and/or alkylaryl-amino compounds can be coupled to at least one

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further primary and/or secondary amino group or at least one further reactive or reactively modifiable or reactively activatable functional group.

As further reactive or reactively modifiable or reactively activatable functional group carboxylic acid anhydride, carboxylic acid anhydride derivative, which can also be recycled as dicarboxylic acid and/or carbonic half-ester compound to anhydride,

-COOH, -CO-halogen, -COOR, -CO-OOR, -O-CO-OR, -SO₃H, -SO₂NRR*, -SO₂N₃, -SO₂-halogen, aliphatic and/or aromatic -OH, aliphatic and/or aromatic -SH, (meth-)acrylic ester, allyl and other olefinically unsaturated polymerizable compounds and/or polymers, cyanohydrin, -NCO, -NH-CO-OR, -NH-CS-OR, -NR*-CO-NR**R***, -N*-CS-R**R***, -CHO, -COR can be coupled, and R, R*, R** and/or R*** are alkyl-X_m, aryl-X_n or alkyaryl-X_o, or R, R*, R** and/or R*** bonded to N are H, and X is the same or also different functional groups and with m, n and o being numbers greater than or equal to 0.

Olefinically unsaturated monomers and/or olefinically unsaturated oligomers or olefinically unsaturated polymers can be coupled to the reactive perfluoroalkyl-(peroxy-) radical centers by (co-)polymerization and/or by grafting and at least one substance can be coupled to the ester and/or amide bonds produced via reactions with the -COOH and/or -COF groups and via reactions with the -COOH- and/or -COF groups, aliphatic amino compounds and/or aromatic amino compounds and/or alkylaryl-amino compounds are coupled to at least one further primary and/or secondary amino group or at least one further reactive or reactively modifiable or reactively activatable functional group.

The perfluoropolymer can be radiation-chemically modified.

The perfluoropolymer can be radiation-chemically modified with a radiation dose greater than 50 kGy.

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The perfluoropolymer can be radiation-chemically modified with a radiation dose greater than 100 kGy.

The perfluoropolymer can comprise PTFE in compact or powder form.

The radiation-chemically modified perfluoropolymer powder can be treated through subsequent tempering at low temperatures yielding the –COF groups and the reactive perfluoroalkyl-(peroxy-)radical centers.

The radiation-chemically modified perfluoropolymer powder can be treated by subsequent tempering with humid air.

The radiation-chemically modified perfluoropolymer can be reacted with reactive perfluoroalkyl-(peroxy-) radical centers with olefinically unsaturated monomers and/or olefinically unsaturated oligomers and/or olefinically unsaturated polymers.

The –COOH and/or –COF groups can be reacted at temperatures $>150^{\circ}\text{C}$ with low-molecular and/or oligomeric and/or polymeric substances that contain primary and/or secondary amino groups and/or hydroxy groups and/or amide groups and/or urea groups and/or isocyanate groups and/or blocked/protected isocyanate groups and/or urethane groups and/or uretdione groups, with at least one other functional group in the (macro-) molecule, which are capable of chemical consecutive reactions.

The –COOH and/or –COF groups can be reacted at temperatures $>150^{\circ}\text{C}$ in a reaction with low-molecular and/or oligomeric and/or polymeric substances that contain primary and/or secondary amino groups and/or hydroxy groups, with at least one other functional group in the (macro-) molecule, which are capable of chemical consecutive reactions.

The –COOH and/or –COF groups can be reacted at temperatures $>150^{\circ}\text{C}$ in a reaction with low-molecular and/or oligomeric and/or polymeric substances that contain hydroxy groups

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and/or epoxy groups, with at least one other functional group in the (macro-) molecule, which are capable of chemical consecutive reactions.

The –COF groups can be reacted with a lactam compound or an alcohol compound.

The –COOH and/or –COF groups can be reacted at temperatures $\geq 200^{\circ}\text{C}$ with low-molecular and/or oligomeric and/or polymeric substances that contain amide groups and/or urea groups and/or isocyanate groups and/or blocked/protected isocyanate groups and/or urethane groups and/or uretdione groups, with at least one other functional group in the (macro-) molecule, which are capable of chemical consecutive reactions.

The radiation-chemically modified perfluoropolymer powder can be reacted with reactive perfluoroalkyl-(peroxy-)radical centers with olefinically unsaturated monomers and/or olefinically unsaturated oligomers and/or olefinically unsaturated polymers, and the –COOH and/or –COF groups are reacted at temperatures $> 150^{\circ}\text{C}$ with low-molecular and/or oligomeric and/or polymeric substances that contain primary and/or secondary amino groups and/or hydroxy groups and/or amide groups and/or urea groups and/or isocyanate groups and/or blocked/protected isocyanate groups and/or urethane groups and/or uretdione groups, with at least one other functional group in the (macro-)molecule, which are capable of chemical consecutive reactions, or the –COOH and/or –COF groups are reacted at temperatures $> 150^{\circ}\text{C}$ in a reaction with low-molecular and/or oligomeric and/or polymeric substances that contain hydroxy groups and/or epoxy groups, with at least one other functional group in the (macro-)molecule, which are capable of chemical consecutive reactions, or the –COF groups are reacted with a lactam compound or an alcohol compound.

Page 4, please delete the paragraph appearing at lines 1 and 2.

Page 4, between lines 2 and 3, please insert the section header:

Detailed Description

Please replace the paragraph appearing at page 7, line 24 to page 8, line 12 with the following amended paragraph:

With the advantageously radiation-chemical modification of perfluoropolymer, ~~are formed~~ of the reactive perfluoroalkyl-(peroxy-)radical centers are formed which surprisingly are capable of the coupling of monomer(s) and/or polymer(s) through radical reactions, such monomers and polymers which are also capable of substitution reactions and/or addition reactions. With a plasma treatment, superficially similar reactive perfluoroalkyl-(peroxy)radical centers can be produced and used for this coupling reaction; however, these reactive perfluoroalkyl-(peroxy-)radical centers are not optimal in their distribution and density compared to the reactive perfluoroalkyl-(peroxy-)radical centers produced radiation-chemically. Thus, after the PTFE micropowder modification with monomers in solution after the separation and purification of this PTFE micropowder, a chemical coupling of homopolymers, copolymers or terpolymers, depending on the adjustment of the modification charge, could be proven by means of infrared spectroscopy, i.e., the polymer chains were no longer detachable via extraction from the PTFE. Compared to PTFE micropowders without reactive perfluoroalkyl-(peroxy-)radical centers or also in the presence of uncombined radical initiators, no modified PTFE micropowders were formed; the PTFE micropowder could be separated quantitatively and unchanged in substance.

Page 11, between lines 23 and 24, please insert the section header:

Examples